FIG. 1

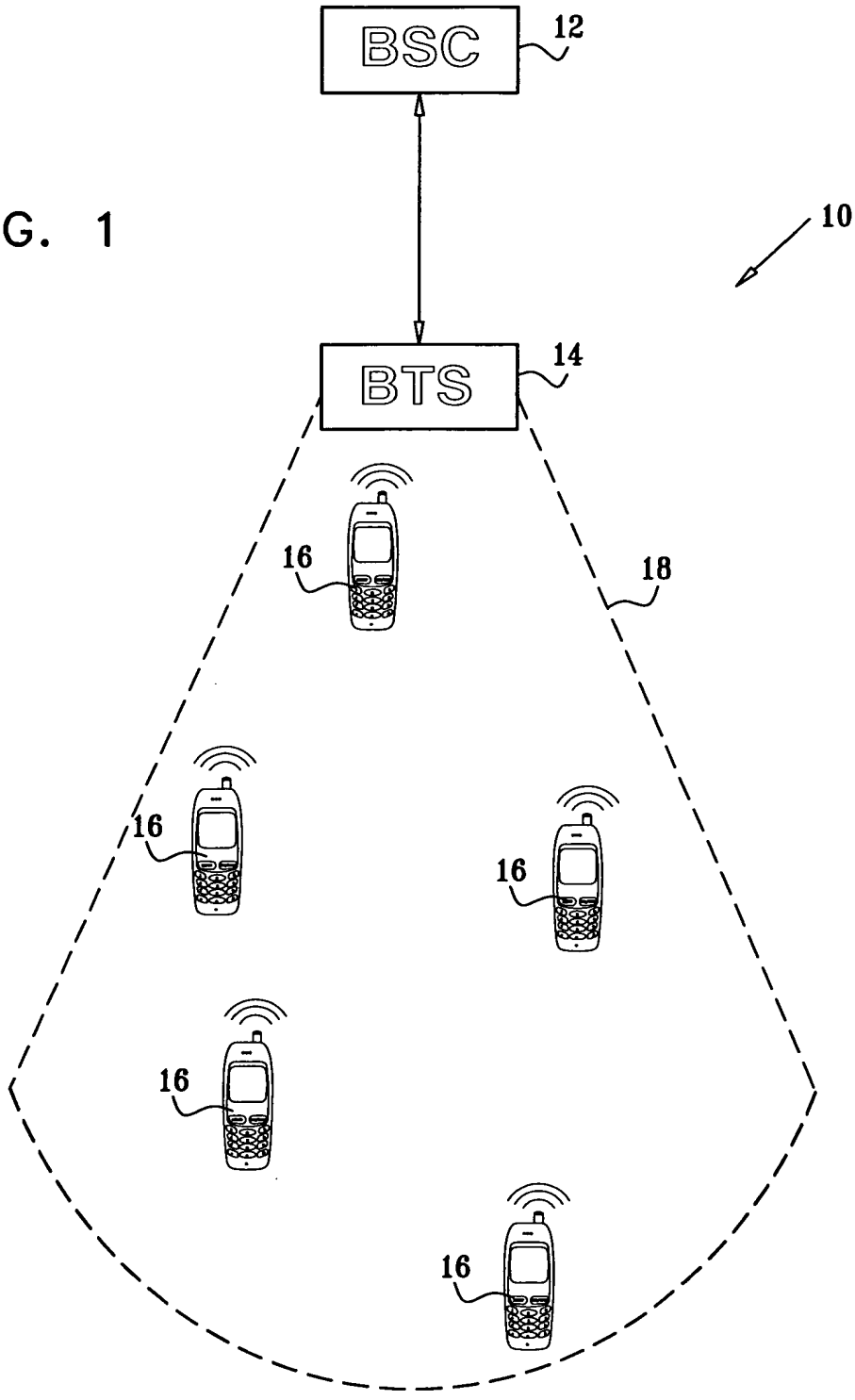

FIG. 2

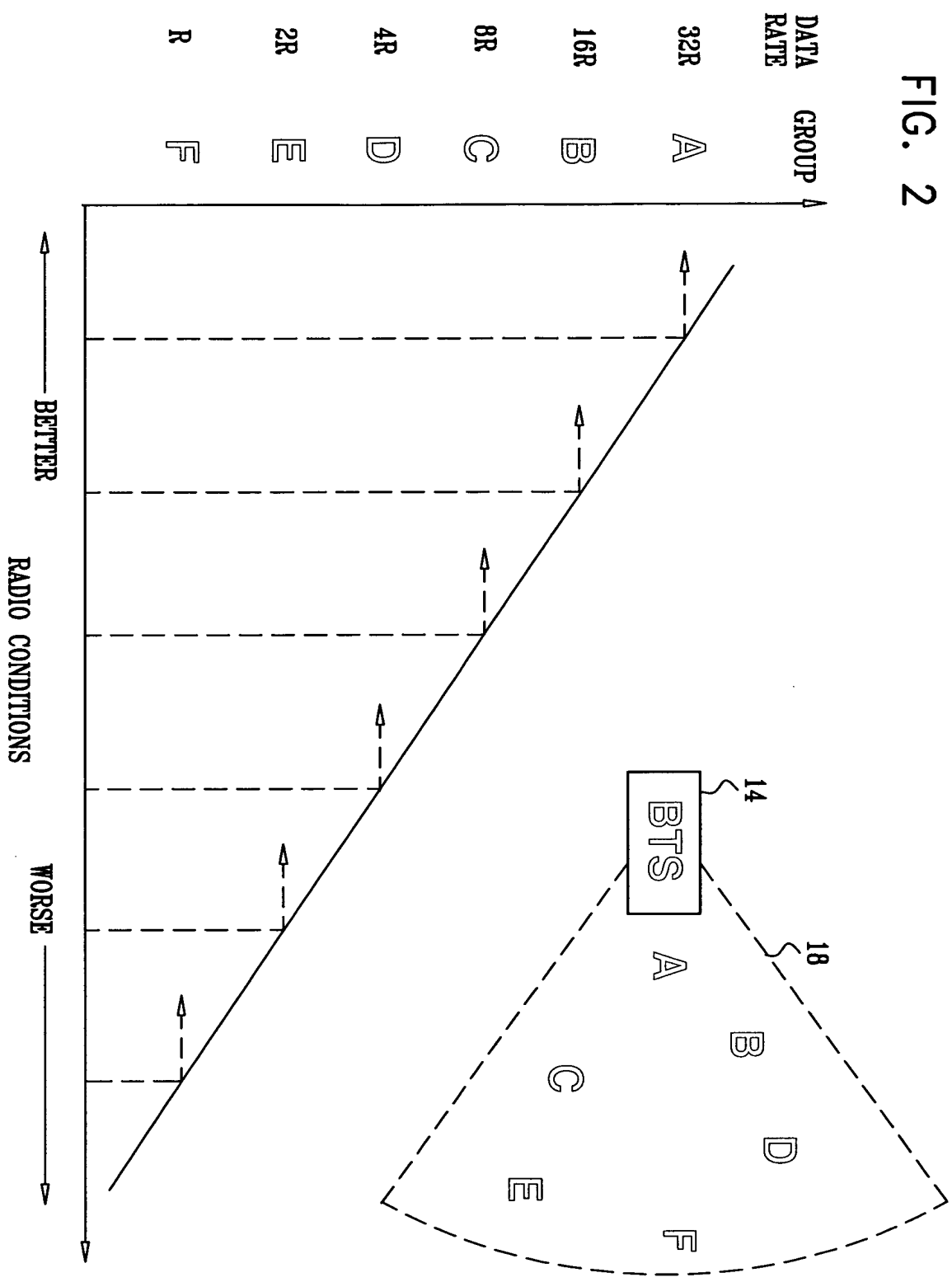
DATA RATE
GROUP
32R
A
16R
B
8R
C
4R
D
2R
E
R
F
BETTER
RADIO CONDITIONS
WORSE
14
BTS
18
A
B
C
D
E
F

FIG. 3

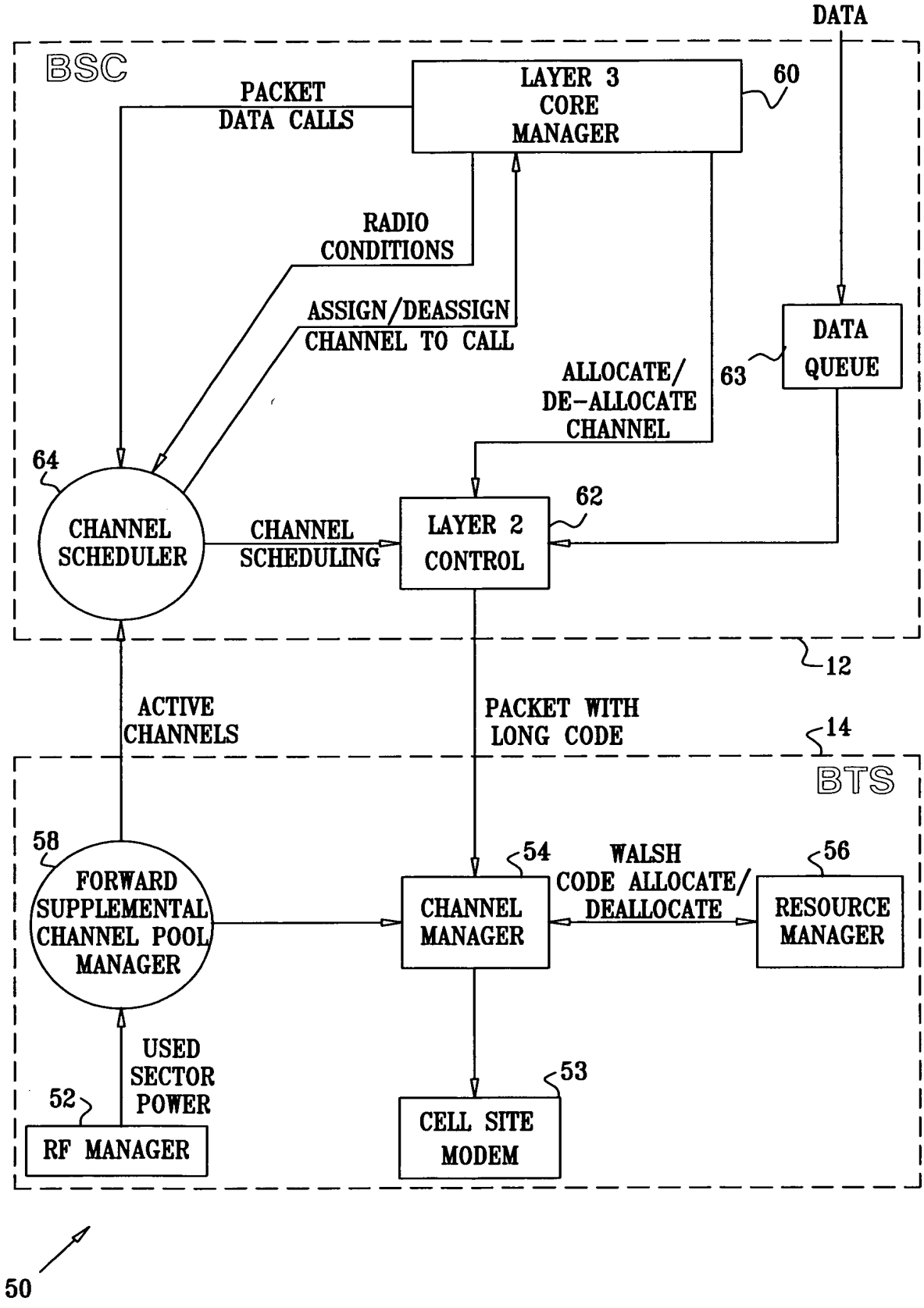
DATA
BSC
PACKET DATA CALLS
LAYER 3 CORE MANAGER
60
RADIO CONDITIONS
ASSIGN/DEASSIGN CHANNEL TO CALL
DATA QUEUE
63
ALLOCATE/ DE-ALLOCATE CHANNEL
64
CHANNEL SCHEDULER
CHANNEL SCHEDULING
LAYER 2 CONTROL
62
12
ACTIVE CHANNELS
PACKET WITH LONG CODE
14
BTS
58
FORWARD SUPPLEMENTAL CHANNEL POOL MANAGER
54
CHANNEL MANAGER
WALSH CODE ALLOCATE/ DEALLOCATE
56
RESOURCE MANAGER
USED SECTOR POWER
52
RF MANAGER
53
CELL SITE MODEM
50

FIG. 4

| ACTIVE CHANNEL POOL | | | | |
|---|---|---|---|---|
| CHANNEL i | IDENTITY $H_i$ | RATE $r_i$ | WALSH CODE $W_i$ | MAXIMUM POWER $P_i$ |
| 1 | 0x12345678 | 153.6kbps | WALSH 2(LEN 8) | -5 dB |
| 2 | ⋮ | ⋮ | ⋮ | ⋮ |
| 3 | ⋮ | ⋮ | ⋮ | ⋮ |
| 4 | ⋮ | ⋮ | ⋮ | ⋮ |
| ⋮ | ⋮ | ⋮ | ⋮ | ⋮ |

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| CHANNEL NUMBER | |
|---|---|
| RATE r | NUMBER OF CHANNELS $D_r$ |
| 1x | ⋮ |
| 2x | ⋮ |
| 4x | ⋮ |
| 8x | ⋮ |
| 16x | 1 |
| 32x | ⋮ |

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| CHANNEL POWER | |
|---|---|
| RATE r | MAXIMUM POWER $RP_r$ |
| 1x | ⋮ |
| 2x | ⋮ |
| 4x | ⋮ |
| 8x | ⋮ |
| 16x | -3 dB |
| 32x | ⋮ |

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FIG. 5

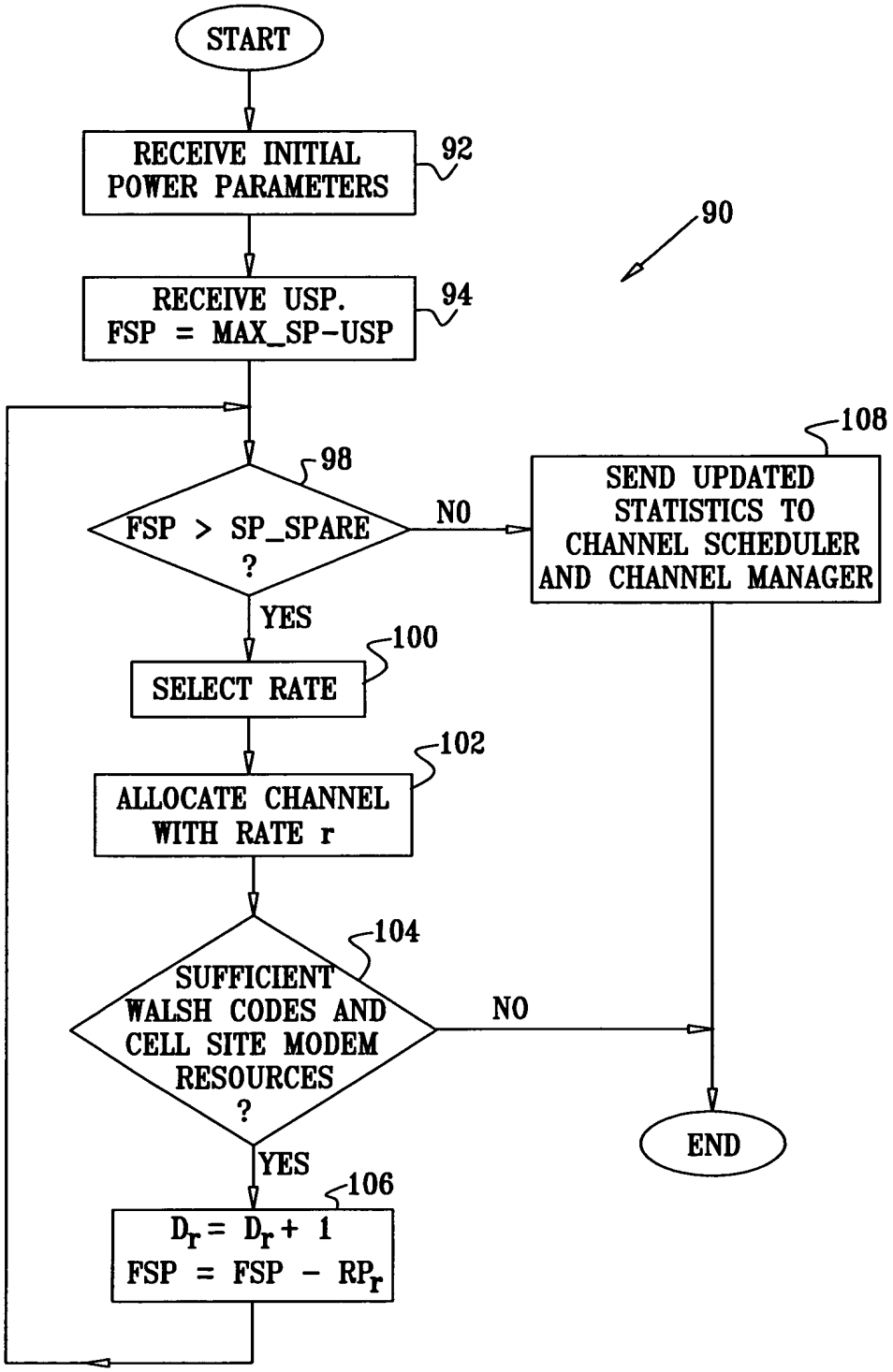
START
RECEIVE INITIAL POWER PARAMETERS
92
90
RECEIVE USP. FSP = MAX_SP-USP
94
108
98
FSP > SP_SPARE ?
NO
SEND UPDATED STATISTICS TO CHANNEL SCHEDULER AND CHANNEL MANAGER
YES
100
SELECT RATE
102
ALLOCATE CHANNEL WITH RATE r
104
SUFFICIENT WALSH CODES AND CELL SITE MODEM RESOURCES ?
NO
END
YES
106
$D_r = D_r + 1$
$FSP = FSP - RP_r$

FIG. 6

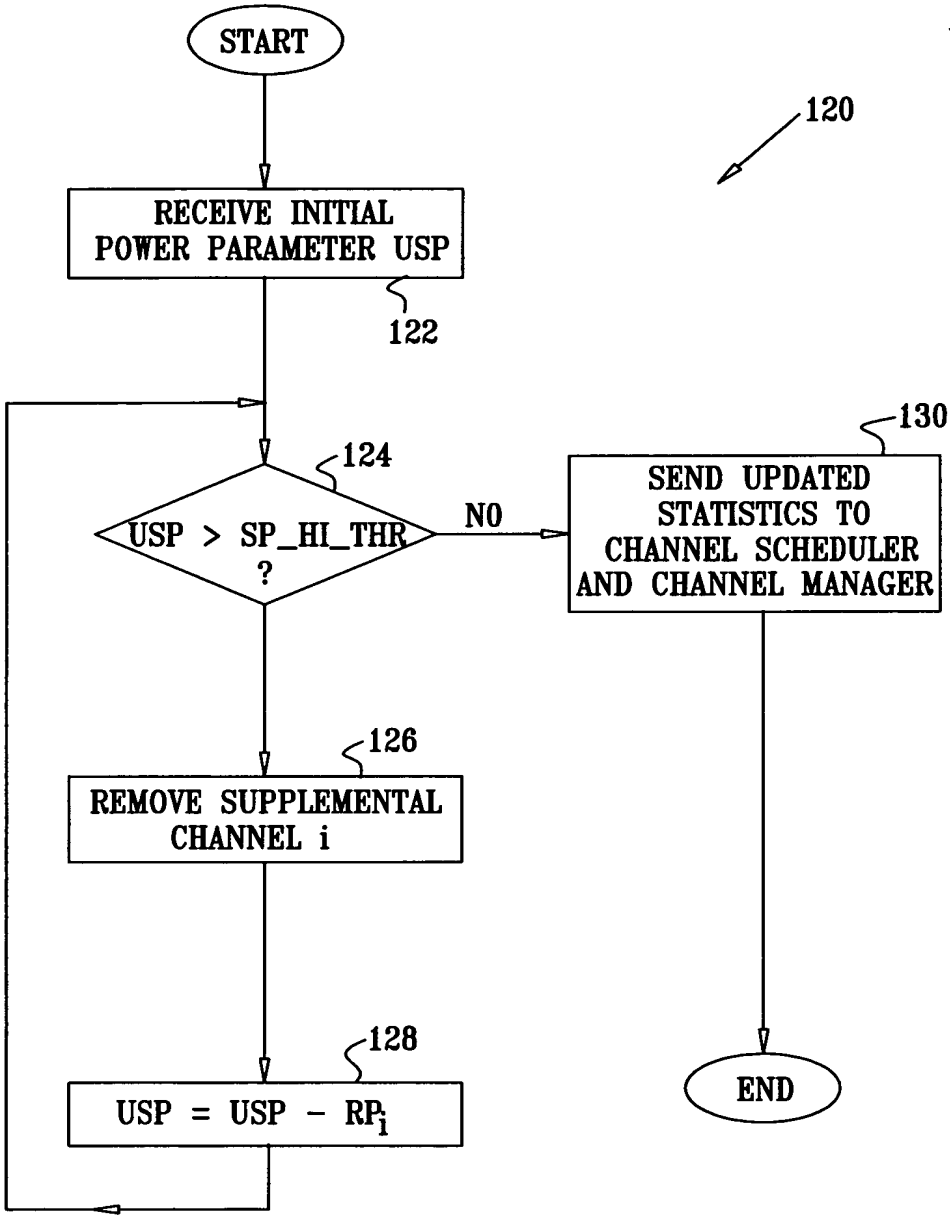
START
120
RECEIVE INITIAL POWER PARAMETER USP
122
124
USP > SP_HI_THR ?
NO
130
SEND UPDATED STATISTICS TO CHANNEL SCHEDULER AND CHANNEL MANAGER
126
REMOVE SUPPLEMENTAL CHANNEL i
128
USP = USP - RP_i
END

FIG. 7

PACKET CALLS

| IDENTITY $ID_k$ | $CI_k$ (C/I) | $A_k$ (ASSIGNED CHANNEL) | $T_k$ (AVERAGE THROUGHPUT RATE) | $S_k$ (CURRENT THROUGHPUT RATE) | $RR_k$ (REQUIRED RATE) |
|---|---|---|---|---|---|
| ⋮ | ⋮ | ⋮ | ⋮ | ⋮ | ⋮ |
| 0x87654321 | -4 | 0x12345678 | 92.16kbps | 153.6kbps | 153.6kbps |
| ⋮ | ⋮ | ⋮ | ⋮ | ⋮ | ⋮ |
| ⋮ | ⋮ | ⋮ | ⋮ | ⋮ | ⋮ |

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CHANNEL ALLOCATION

| IDENTITY $H_i$ | RATE $r_i$ | WALSH CODE $W_i$ |
|---|---|---|
| ⋮ | ⋮ | ⋮ |
| 0x12345678 | 153.6kbps | WALSH 2(LEN 8) |
| ⋮ | ⋮ | ⋮ |

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C/I RANGES

| C/I RANGE | CHANNEL REQUIRED RATE RR |
|---|---|
| • • — • • | 1x |
| • • — • • | 2x |
| • • — • • | 4x |
| • • — • • | 8x |
| -5 — -4 | 16x |
| • • — • • | 32x |

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FIG. 8

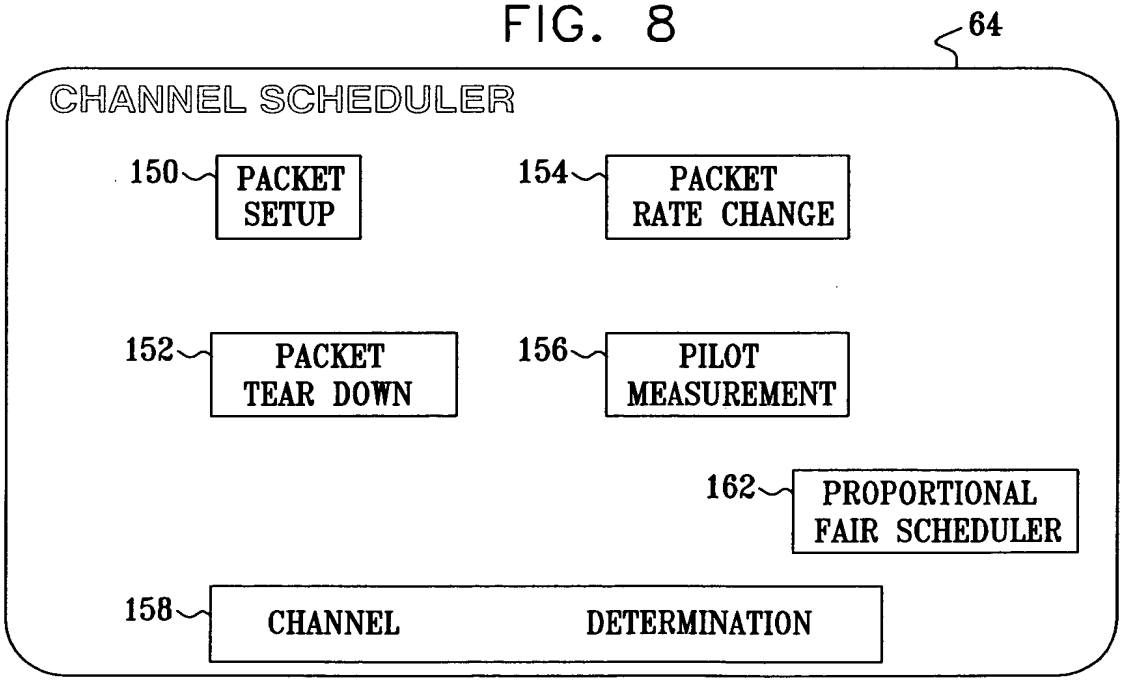


FIG. 9

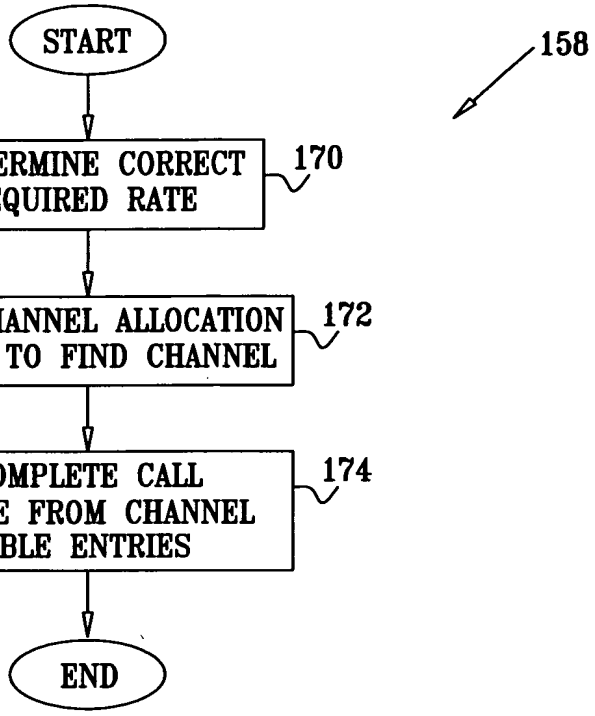

START
158
DETERMINE CORRECT REQUIRED RATE
170
USE CHANNEL ALLOCATION TABLE TO FIND CHANNEL
172
COMPLETE CALL TABLE FROM CHANNEL TABLE ENTRIES
174
END

FIG. 10

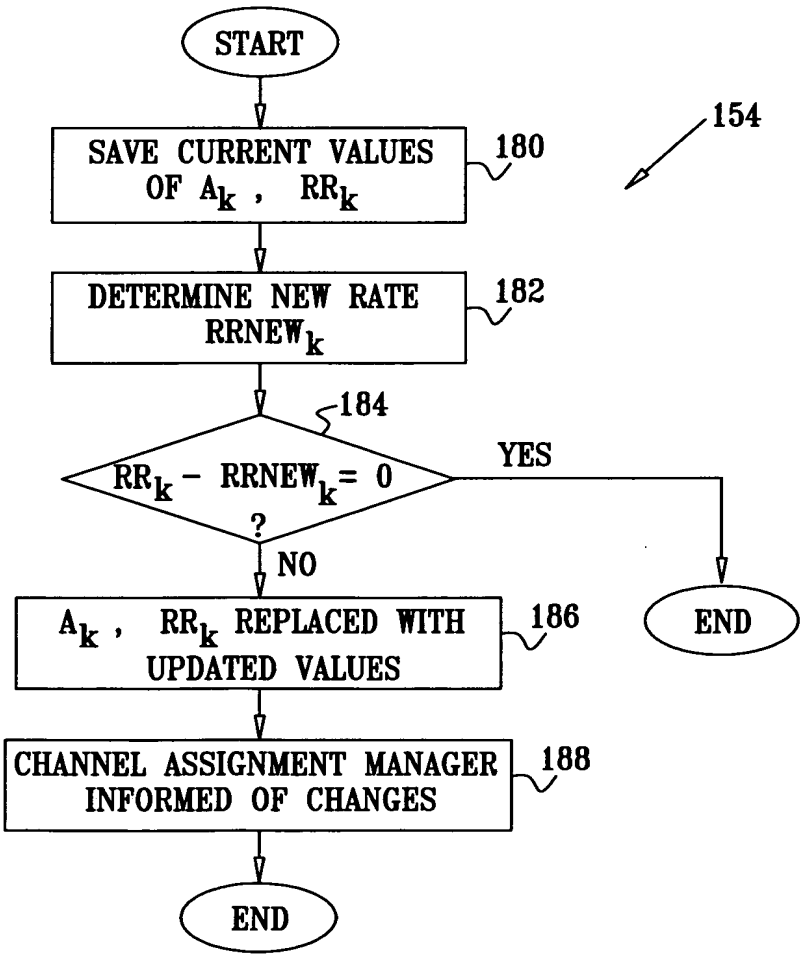
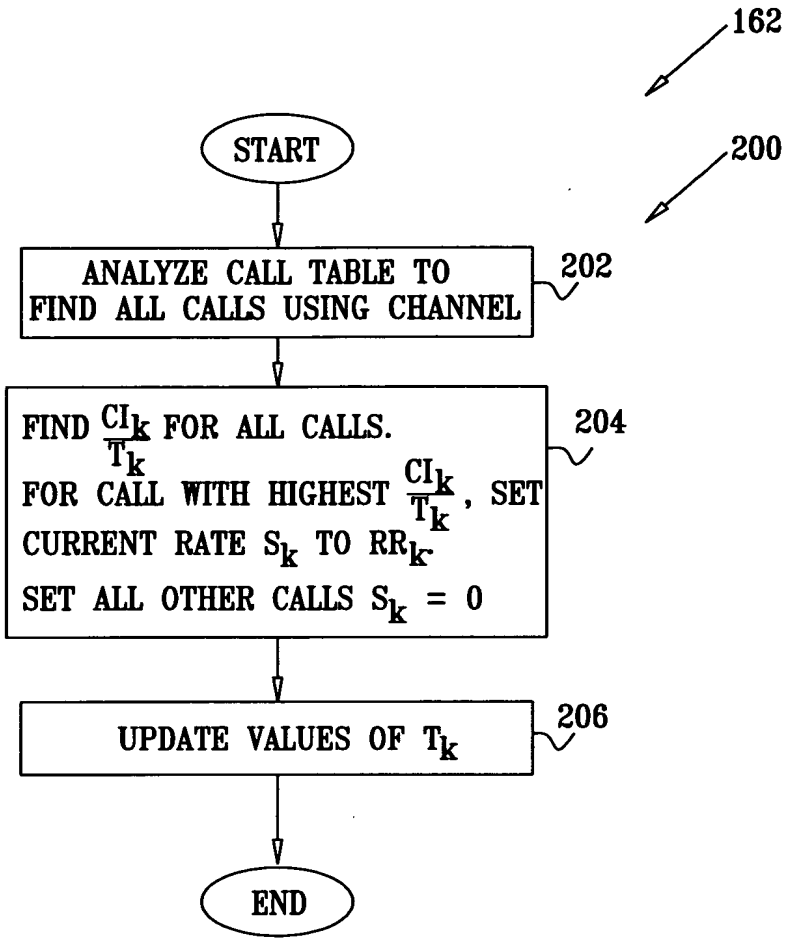

START
154
SAVE CURRENT VALUES OF $A_k$ , $RR_k$
180
DETERMINE NEW RATE $RRNEW_k$
182
184
$RR_k - RRNEW_k = 0$ ?
YES
NO
END
$A_k$ , $RR_k$ REPLACED WITH UPDATED VALUES
186
CHANNEL ASSIGNMENT MANAGER INFORMED OF CHANGES
188
END

FIG. 11


162
200
START
ANALYZE CALL TABLE TO FIND ALL CALLS USING CHANNEL
202
FIND $\frac{CI_k}{T_k}$ FOR ALL CALLS.
FOR CALL WITH HIGHEST $\frac{CI_k}{T_k}$, SET CURRENT RATE $S_k$ TO $RR_k$.
SET ALL OTHER CALLS $S_k = 0$
204
UPDATE VALUES OF $T_k$
206
END